

## **APPENDIX 1**

### **NCWAP Program Introduction and Overview**

The North Coast Watershed Assessment Program (NCWAP) was established in 2000 to provide a consistent scientific foundation for collaborative watershed restoration efforts and to better meet the State needs for protecting and restoring salmon. This effort was initiated by the California Resources Agency in response to requests by landowners, industry and environmental groups, watershed groups, a Science Review Panel on Forest Practices, and others for state leadership in assessing the health and conditions of north coast watersheds.

The program was developed as an interagency effort by the California Resources Agency and CalEPA, and includes the Departments of Fish and Game (DFG), Forestry and Fire Protection (CDF), Conservation's Division of Mines and Geology (DMG), and Water Resources (DWR), and the State Water Resources Control Board's North Coast Region (RWQCB). The Institute for Fisheries Resources is also a participant in this program. The geographic scope of the program corresponds to the North Coast Hydrologic Region (Figure 1). This includes about 6.5 million acres of private watershed lands over a total area of 12 million acres. The assessment is designed to cover all private watershed lands over a period of about seven years.

The need for comprehensive watershed information grew in importance with listings of salmonids as threatened species, the TMDL consent decree, and the proliferation of assistance grants for protecting and restoring watersheds.

Listings under the federal Endangered Species Act for areas within the NCWAP region (the North Coast Hydrologic Unit) began with coho salmon in 1966, followed by Chinook salmon in 1999 and steelhead in 2000. In 2001, coho was proposed for listing under the California Endangered Species Act in 2001. Concerns about the potential impacts of salmonid listings and TMDLs on the economy are particularly strong on the North Coast where natural-resource dependent industries predominate. Many of these activities, along with natural processes, can impact watershed conditions and fish habitat, including landslides, flooding, timber harvest, mining, ranching, agricultural uses and development. In order to recover California's salmonid fisheries, it is necessary to first assess and understand the linkages among management activities, dominant ecological processes and functions, and the factors really limiting populations and their habitat.

The North Coast Watershed Assessment Program integrates and augments existing watershed assessment programs within proven methodologies and manuals available from each department. The program also responds to recommendations of the Scientific Review Panel (SRP) which was created under the auspices of the State's Watershed Protection and Restoration Council, as required by the March 1998 Memorandum of Understanding (MOU) between the National Marine Fisheries Service (NMFS) and the California Resources Agency. The MOU required a comprehensive review of the California Forest Practice Rules (FPRs) with regard to their adequacy for the protection of salmonid species. In addition, the promise of significant new state and federal salmon restoration dollars highlighted the need for watershed assessments to ensure those dollars are well spent.

#### **PROGRAM GOALS**

The goals of the program are to:

1. Provide baseline data for evaluating the effectiveness of various resource protection programs over time;
2. Guide watershed restoration programs, e.g., targeting grant dollars to those projects that most efficiently and effectively recover salmonid populations, and assisting local watershed groups, counties, etc., to develop successful projects;
3. Guide cooperative interagency, nonprofit and private sector approaches to "protect the best" through stewardship, easement and other incentive programs;
4. Help landowners and agencies implement laws that require specific assessments such as the State Forest Practice Act, Clean Water Act and State Lake and Streambed Alteration Act.

The program is designed to answer or begin to assess watershed conditions as they relate to a set of critical questions about suitability for salmon habitat, tailoring the assessment process to those that are most relevant to each watershed. The questions include the following:

- What are the general relationships between land uses history (development, timber harvest, agriculture, roads, dams diversions, and mining) affected and the current vegetation and level of disturbance in North Coast watersheds? How can these kinds of disturbance be meaningfully quantified?
- What is the spatial and temporal distribution of sediment sources from landsliding, bank, sheet and rill erosion, and other erosion mechanisms, and what is the relative importance of each source in North Coast watersheds?
- What are the effects of stream, spring and groundwater uses on water quality and quantity?
- What role does large woody debris have within the watershed in forming fish habitat and determining channel class and storing sediment?
- What are the current salmonid habitat conditions in the watershed and estuary (flow, water temperature/shade, sediment, nutrients, instream habitat, LWD and its recruitment); how do these compare to desired conditions (life history requirements of salmon, Basin Plan water quality objectives)?
- What are the sizes, distributions and relative healthiness of populations of salmonids within watersheds?
- Do current populations and diversity of aquatic communities (especially salmonid fishes, macroinvertebrates, and algae) reflect existing watershed and water quality conditions?

## ASSESSMENT PROCESS

Since watersheds are hierarchical in structure and function, we will gather and analyze data at multiple scales to answer these questions, ranging from the stream reach to the subwatershed and finally whole watershed or basin. While the NCWAP is primarily an assessment with existing data, some new data collection will occur as resources allow to provide a current picture of some components of a watershed. With respect to temporal scale, NCWAP will discuss processes that have affected these watersheds in pre- European time, but will focus on the current state of a given watershed and its relationship to the land management activities of European-Americans over the past 150 years. Within that period, the program will try to look at changes in the watersheds in the framework of critical dates and periods defined by major natural perturbations, and periods wherein a new resource extraction tool, policy or program entered the scene.

NCWAP will produce and make available to the public of consistent set of products for each basin we assess. They include the following:

- Databases of information that we have used and collected for our analysis. We will also provide a data catalogue which identifies all the information we considered, and evaluates its usefulness for our assessment process, and a bibliography of other references cited in the assessment report.
- Geology and landslide maps and maps of instream sediment and transport zones developed by the Division of Mines and Geology.
- An Ecosystem Management Decision Support (EMDS) model that describes how watershed conditions interact at the stream reach and watershed scale to affect suitability to fish.
- GIS-based models and analyses such as timber harvest frequency, road-based erosion model runs,
- Limited Cumulative Watershed Effects (CWE) (define NCWAP spatial and temporal limitations)
- An interdisciplinary analysis of the results of fieldwork, historical analysis, EMDS and other analytical products about the suitability of stream reaches and the watershed for salmonids.
- An interagency description of historic and current conditions by subwatersheds as they relate to suitability for salmonid fisheries. This will address vegetation cover and change, land use, geology and geomorphology, water quality, streamflow and water use, and instream habitat conditions for salmonids. It will also contain hypotheses about watershed factors that contribute to limiting factors for fish.

- Recommendations for management and restoration to address limiting factors.
- Recommendations for additional monitoring to improve the assessment process.
- A CD developed through the Institute for Fisheries Resources which uses the Klamath Resources Information System tool to store data, provide a regional bibliography of watershed studies and reports, present NCWAP analyses, maps and other products, and store community based data over time.

In order to develop products that the public and agencies will use, we developed a set of principles to guide how we implement the NCWAP assessment process. The following principles are intended to provide a comprehensive, flexible, and reliable body of information for each basin assessment. First, we are committed to providing information for several purposes, including products that meet needs which have been identified by landowners, agencies that work with them, watershed groups, and others. We will work with local stakeholders to help focus our assessments and conduct it in a cooperative and iterative fashion, incorporating relevant information that is available to us. In order to provide a comprehensive, reliable and yet flexible process, we will use a consistent approach to compiling existing data, standardized protocols for collecting new data, and an adaptive methodology for analyzing information that allows for inherent differences among watersheds in conditions, concerns, and availability or access to information. We will manage the process to ensure interdisciplinary analysis by the interagency team to identify limiting factors for salmonid fisheries and potential contributions by various watershed conditions to the watershed's suitability for salmon habitat. Finally, we will provide full and timely public access to all data, products, and reports on hard copy, on-line, and on CD.

The assessment process for each watershed consisted of six basic steps:

- Step One: Scoping. The basin team met several times with stakeholders to identify watershed problems or concerns, local assessment interests, existing data and gaps, and opportunities to work with local interests to collect and analyze data to implement the assessment.
- Step Two: Data Compilation and review. The team compiled existing photos, maps, studies, databases and other types of information. They were screened for quality, using the program's quality control protocols, and for their relevance to the assessment's critical questions and EMDS mode, considering issues such as original intent of studies, methods, scope and scale.
- Step Three: Preliminary analysis. The team developed an interdisciplinary assessment of the watershed's condition, using EMDS to the extent possible, to analyze watershed suitability for salmon habitat and factors potentially limiting fish production. This step helped to identify significant data gaps in order to focus additional field data collection efforts and additional analyses.
- Step Four: Fieldwork. Agencies conducted fieldwork as resources and timing allowed to answer critical questions, develop landslide and sediment maps, and run the EMDS model. This included verification of existing data, imagery or photo-based analyses; installation of stream gauges; and collection of new data to fill critical gaps. Throughout this process, there was coordination with local groups and landowners on access to private property and other matters.
- Step Five: Analysis of Additional Data and Limiting Factors. This step included both analysis of data by individual team members and interdisciplinary analytical processes such as map development, analysis of new field data, GIS-based spatial analyses of multiple types of data, running EMDS with new data, and refinement of hypotheses about linkages among watershed factors and suitability for salmon.
- Step Six: Synthesis Report, Recommendations, and Information Access: The team pulled all the information together into a report that describes the overall condition of the watershed for fisheries, limiting factors for fish, and potential linkages among watershed factors and fish habitat conditions, and which contains recommendations for management, restoration and monitoring. The report will be made available in hard copy (limited quantities), on the KRIS CD, and on-line for review by the public.

## ASSESSMENT SCHEDULE

Five watersheds were slated for NCWAP's first year on two completion schedules:

### Redwood Creek, Mattole River, Gualala River

- Nov 1, 2001 – draft assessment report to contributors for review
- Nov 15, 2001 – draft assessment report to agency directors for internal review
- Dec 1, 2001 – briefings of agency directors completed
- Feb 1, 2002 – draft assessment to the Legislature, followed by release to the public
- Apr 1, 2002 – public review completed
- May 1, 2002 – final assessment to the Legislature

### Albion River, Big River

- Mar 1, 2002 – draft assessment report to contributors for review
- Mar 15, 2002 – draft assessment report to agency directors for internal review
- Mar 15, 2002 – briefings of agency directors completed
- Apr 1, 2002 – draft assessment to the Legislature, followed by release to the public
- Jul 1, 2002 – public review completed
- Sept 1, 2002 – final assessment to the Legislature